Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (cancelled)

2. (cancelled)

3. (cancelled)

4. (cancelled)

5. (cancelled)

6. (cancelled)

7. (cancelled)

8. (cancelled)

9. (cancelled)

10. (cancelled)

11. (cancelled)

12. (cancelled)

13. (cancelled)

14. (cancelled)

15. (cancelled)

16. (cancelled)

17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (cancelled)

21. (cancelled)

22. (cancelled)

23. (cancelled)

24. (cancelled)

25. (Currently amended) An integrated electrokinetic circuit for transport of an aqueous solute, comprising ~~a device as defined in claim 1~~ a device for electrokinetic transport of an aqueous solute, the device comprising

an electrically insulating substrate;

a conductor element for electrokinetic transport of the solute, the conductor element being in the form of a solid hydrophilic-matrix layer on the substrate, the matrix layer being in a substantially dry, inactive state wherein electrokinetic transport is substantially prevented and having a first surface engaging the substrate and a second surface; and

a cover layer for electrically insulating and covering the second surface, the cover layer being impermeable to the solute;

whereby exposure of the hydrophilic matrix to water converts the matrix from the inactive state to a hydrated, active state permitting electrokinetic transport of the solute.

26. (Currently amended) The integrated circuit as defined in claim 25, comprising a plurality of devices ~~as defined in claim 1~~ for electrokinetic transport of an aqueous solute, each device comprising

an electrically insulating substrate;

a conductor element for electrokinetic transport of the solute, the conductor element being in the form of a solid hydrophilic-matrix layer on the substrate, the matrix layer being in a substantially dry, inactive state wherein electrokinetic transport is substantially prevented and having a first surface engaging the substrate and a second surface; and

a cover layer for electrically insulating and covering the second surface, the cover layer being impermeable to the solute;

whereby exposure of the hydrophilic matrix to water converts the matrix from the inactive state to a hydrated, active state permitting electrokinetic transport of the solute.

27. (original) The integrated circuit as defined in claim 26, wherein the conductor elements do not overlap.

28. (original) The integrated circuit as defined in claim 26, wherein at least a pair of conductor elements intersect and are in contact with each other for exchange of transported solute species.

29. (original) The integrated circuit as defined in claim 26, wherein at least a pair of the conductor elements intersect and are insulated from each other for preventing electrical contact and solute species exchange.

30. (original) The integrated circuit as defined in claim 25, further comprising a means for introducing water into the conductor element.

31. (original) The integrated circuit of claim 29, further comprising a means for introducing the aqueous solute into the conductor element.

32. (original) The integrated circuit of claim 25, wherein the hydrophilic solid matrix layer is micro-fabricated onto the substrate.

33. (original) The integrated circuit of claim 25, wherein the hydrophilic-solid matrix layer is a dry reagent film.

34. (original) The integrated circuit of claim 25, wherein the cover layer is micro-fabricated onto the conductor element and the substrate.

35. (original) The integrated circuit of claim 25, wherein at least one of the cover layer and the substrate has at least one portion which is permeable to water vapor.

36. (original) The integrated circuit of claim 25, further including a pair of spaced apart electrodes in electric contact with the conductor element at spaced apart locations for applying an electric potential across the conductor element.

37. (original) The integrated circuit of claim 35, wherein the electrodes are applied to the substrate, and the device further includes an insulator layer for electrically insulating each electrode, the insulator layer having an opening in each region of overlap between one of the electrodes and the conductor element for permitting electric contact of the conductor element with the integral electrodes for electrokinetic pumping.

38. (original) The integrated circuit of claim 25, wherein the substrate is made of electrically insulating material.

39. (original) The integrated circuit of claim 25, wherein the substrate includes a layer of electrically conductive material and a layer of electrically insulating material intermediate the layer of conductive material and the conductor element.

40. (original) The integrated circuit of claim 25, further comprising an input region for supply of solute into the conductor element and an output region spaced apart therefrom for removal of transported solute from the conductor element.

41. (original) The integrated circuit of claim 40, wherein the hydrophilic matrix of the conductor element is water-insoluble in the input and output regions.

42. (original) The integrated circuit of claim 41, wherein the conductor element further comprises a reservoir region intermediate the input and output regions and including at least one chemical reactant for interaction with the transported solute.

43. (original) The integrated circuit of claim 42, further comprising an electrode for applying an electric potential to the reservoir region.

44. (original) The integrated circuit of claim 43, comprising first and second conductor elements, the first conductor element including the reservoir region and the second conductor element overlapping the first conductor element in a reaction region for uptake of a preselected reaction product created in the reaction region between the reactant and the solute.

45. (original) The integrated circuit of claim 25, further comprising a first reservoir region adjacent one of the input and output regions and including a chemical reactant for interaction with the transported solute.

46. (original) The integrated circuit of claim 45, further comprising a pair of electrodes for the conductor element for selectively applying a potential to the conductor element for driving electrokinetic solute transport from the input region to the output region.

47. (original) The integrated circuit of claim 46, wherein the conductor element further comprises a second reservoir region located intermediate the input and output region of the conductor element and including at least one chemical reactant for interaction with the transported solute.

48. (original) The integrated circuit of claim 47, further comprising an electrode for applying an electric potential to at least one of the first and second reservoir regions.

49. (original) The device of claim 22, wherein the reservoir region includes chemical reactants for performing a nucleic acid amplification or sequencing reaction.

50. (original) The integrated circuit of claim 42, wherein the reservoir region includes chemical reactants for performing a nucleic acid amplification or sequencing reaction.

51. (original) The integrated circuit of claim 45 or 47, wherein at least the first reservoir region includes chemical reactants for performing a nucleic acid amplification or sequencing reaction.

52. (Currently amended) The integrated circuit of claim 45, including a plurality of conductor elements, each conductor element having an associated ~~reservior~~ reservoir region for contact with a sample solution including the chemical reactant.

53. (original) The integrated circuit of claim 25, further comprising a pair of spaced apart electrokinetic electrodes for applying an electric potential to the conductor element for displacing along the conductor element the solvent containing the solute species.

54. (original) The integrated circuit of claim 52, wherein the plurality of conductor elements and processing regions are constructed as a ligand-binding array and the sample solution contains species for binding with ligands associated with the ligand binding array.

55. (original) The integrated circuit of claim 54, wherein the ligand-binding array is selected from the group of antibody arrays, DNA arrays and RNA arrays.

56. (original) The integrated circuit of claim 53, including a plurality of conductor elements, each conductor element having a pair of associated electrokinetic electrodes, and each pair of electrodes being separately controlled for individual control of the solvent transport in the respectively associated conductor element.